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A new species of *Neodactria* Landry, 1995 (Lepidoptera: Pyralidae, Crambinae) from Arizona, U.S.A.

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Abstract. So far only two species of *Neodactria* Landry have been found in the state of Arizona: *N. luteolellus* (Clemens, 1860) and *Neodactria cochisensis* Landry & Albu, **sp. n.** described and illustrated here from the Huachuca and Chiricahua Mountains of Cochise County. It differs from the other members of the genus most conspicuously by the curved and dorsally projecting costal process of the valva and in the female by the diminutive anterior apophyses and the regularly cylindrical corpus bursae.

Keywords: Lepidoptera, Pyraloidea, Pyralidae, Crambinae, *Neodactria*, new species, U.S.A., Arizona, Cochise County.

Introduction

In June-July 2011, the Sierra Vista region of south-eastern Arizona was immolated by the Monument Fire, one of the most devastating wildfires on record for that area. The second author (VA) visited the region between July 17 and 21, at the beginning of the monsoon season. By then the fire had been extinguished, but the charred tree remnants throughout the Huachuca Mountains remained as evidence of the devastation. Wildfires are a regular annual occurrence in south-eastern Arizona, especially before the monsoon season. Many of them are caused by lightning, but many also are started by human activities. These fires are an integral part of the natural, evolutionary forces that shape the local flora and fauna. In the last 100 years, human actions of prevention and containment of wildfires have resulted in an increase in the vegetation mass which in turn has fuelled ever more intense blazes. The year 2011 set a record in total acreage burned in Arizona, over 1,000,000 acres by August 31st, according to the Arizona Geological Survey. The Monument Fire was relatively moderate in size (it burned around 30,500 acres over its 1 month life from June 12th to July 12th), but its raging over inhabited areas of the southern Huachuca Mountains, around the town of Sierra Vista, caused the greatest damage to man-made structures in the area.

The fire spread had been erratic and so, while some areas were totally consumed (e.g. Ash, Miller, and Carr Canyons), others were spared and sustained relatively little damage. This was the case of Ramsey Canyon. VA spent the time in a cabin on Ramsey Canyon Road (31.452444, -110.303491), at 1615 m altitude, close to the Ramsey Canyon Preserve. This is a mid-elevation locality in the Huachuca Mountains, one of South-eastern Arizona's "sky islands." These are mountain ranges rising abruptly from the surrounding lowlands of strikingly different habitats. They can ascend from the desert floor to pine and snow covered peaks. This proximity, yet isolation of the different mountains and their altitudinal zonation creates unique biogeographical conditions for floral and faunal endemism, relict populations, and vertical migrations. They present a strong analogy to a group of islands surrounded by channels of ocean. Among the Lepidoptera attracted to the light at the cabin were three small, unusual-looking crambines. Unable to identify them, VA consulted the first author (BL) as to their identity, and the new species status of this taxon was thus confirmed.

BL had collected himself one male in 1989 at Ash

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Figure 1. Holotype of *Neodactria cochisensis* **sp. n.**

Canyon, and he had associated it with a potentially conspecific female collected by J. Brown in 1986 at Turkey Creek in the Chiricahua Mountains. These specimens remained undescribed until now for lack of material.

Genus *Neodactria* Landry, 1995 contains only eight species according to the most up-to-date list available (Nuss *et al.*, 2012). Three of them were described during the last decade (Landry & Metzler, 2002; Landry & Brown, 2005).

Material and methods

At the type locality VA collected three specimens, that became the holotype and two paratypes, with a 150 W mercury vapour lamp set next to a white sheet. The same method was used by BL and J.-F. Landry when they collected the other known male at Ash Canyon.

Terminology follows Landry (1995) except for the use of 'phallus', instead of 'aedeagus' as recommended by Kristensen (2003).

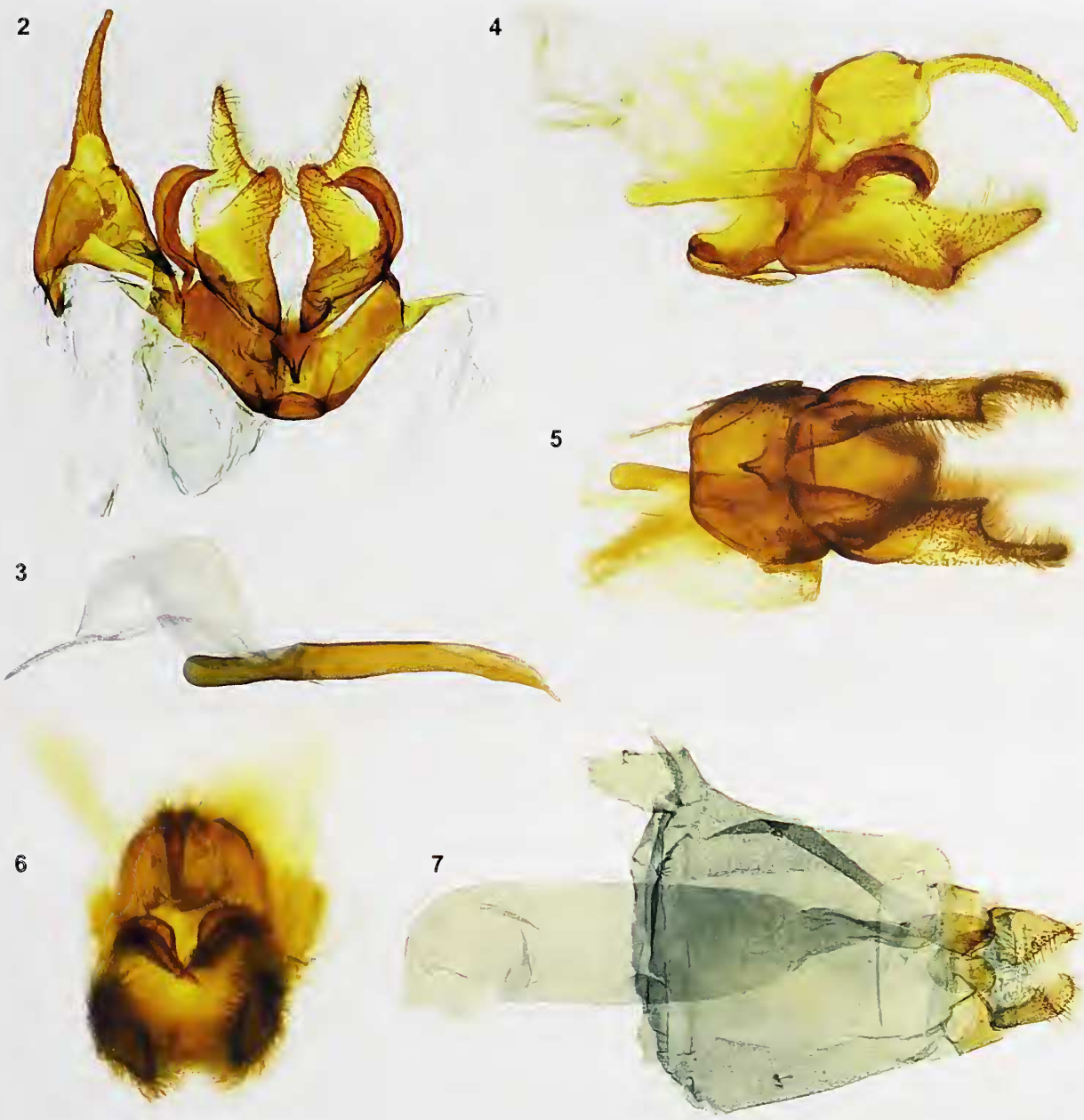
The following acronyms are used: MHNG for Muséum d'histoire naturelle de Genève, Geneva, Switzerland; UCB for Essig Museum, University of California at Berkeley, California, U.S.A.; USNM for National Museum of Natural History, Washington, D.C., U.S.A.; and VAC, for Valeriu Albu Collection.

Neodactria cochisensis Landry & Albu, sp. n. Figs 1–9

Diagnosis. This species is similar in size and wing markings to smaller specimens of some of *N. luteolella* (Clemens) populations, but the forewing ground colour appears grey and the markings include a paler longitudinal streak in the cell and a darker diagonal dash from end of cell to apex. The male genitalia, especially the shape of the costal process of the valva, will readily separate this species from other members of the genus. In female genitalia, the unusually short anterior apophyses and the cylindrical shape of the corpus bursae are diagnostic.

Material examined: Holotype ♂ (Fig. 1): 1- 'Legit V[aleriu] M[agdalena]S[ebastian]A[lexander] Albu | Cochise Co./Arizona | Ramsey Canyon | 17 – 21 VII 2011' [printed black on white card stock]; 2- 'HOLOTYPE | Neodactria | cochisensis | Landry & Albu' [hand-written in black ink on red card stock]. Head and thorax partly rubbed, with appendages complete, not dissected, generally darker than paratypes. Deposited in the USNM. **Paratypes**: 3 ♂, 1 ♀: 2 ♂ (one with genitalia on slide BL 1780), with same data as holotype (VAC); 1 ♂ (genitalia slide BL 163), USA, AZ, Huachuca M[oun]t[ain]s, Ash C[an]y[o]n R[oa]d, 1550 m, 2.viii.1989, M[ercury]V[apour]L[ight] (B. & J.-F. Landry) (MHNG); 1 ♀ (genitalia slide BL 1369), Ariz., Cochise CO., Turkey Cr[eek]., 5600' [1707 m], Chiricahua Mtns., 1-2.viii.[19]86, b[lack] l[ight] trap (J. Brown) (UCB).

Description. MALE (n=4). (Fig. 1). Head greyish brown, with scales often tricolored, greyish brown in middle and paler at bases and tips, to whitish beige. Labial palpus slightly less than 4 times as long as widest diameter of compound eye; mottled greyish brown with tricolored scales as on head, often with uniformly white scales, especially ventrally. Maxillary palpus mottled greyish brown with tricolored scales as on head, white medially. Proboscis scales white to whitish grey. Antenna with scape and



Figures 2–7. Genitalia of *Neodactria cochisensis* **sp. n**. **2.** Male genitalia, slide BL 1780, without phallus. **3.** Phallus (enlarged compared to Fig. 2). **4.** Male genitalia in lateral view, same preparation, prior to mounting. **5.** Same, ventral view. **6.** Same, apical view. **7.** Female genitalia, slide BL1369, ventral view.

pedicel white and greyish brown; flagellum whitish grey. Thorax mottled greyish brown with tricolored scales as on head, with more uniformly paler whitish grey and lustrous scales on tegulae. Foreleg laterally dark greyish brown, darker at tip of coxa, beige on epiphysis, whitish grey at tips of tarsomeres; mostly white medially except for pale greyish brown tarsomeres III-V. Midleg as foreleg but laterally paler. Hindleg paler still, with tibia and first tarsomeres almost entirely snow white. Forewing length 6.5-7.0 mm (holotype: 7.0 mm); forewing colour mostly mottled greyish brown, with bi- or tricoloured scales as on head; median and subterminal lines warmer brown and most conspicuous between M_1 and CuA_2, paler, greyish brown with light yellowish scales between CuA_2 and inner margin; additional markings as a white streak in cell and until subterminal line, sometimes with darker scales especially distally, a dark brown dash from end of cell to apex, often interrupted after subterminal line, a yellowish-beige line along cubital stem and CuA_2, often less conspicuous distally, light silver lustrous scales as small patches above yellowish line on distal half and along subterminal line posteriorly, and thin dark brown terminal line from apex to above tornus; fringe lustrous with basal row of shorter scales brown at apex, white with two pale greyish-white spots until M_3, pale greyish-white until tornus,

Figures 8, 9. Photographs of collecting localities of *Neodactria cochisensis* **sp. n. 8.** Old Homestead and surrounding vegetation in Ramsey Canyon Preserve at 1676 m in elevation and at 1100 m southwest of type locality (Photo by Sebastian Albu). **9.** Ash Canyon at paratype locality (Photo by J.-F. Landry).

with second row of longer scales pale greyish brown. Hindwing greyish brown; fringe with pale scales, with basal row of shorter scales pale greyish white, with second row of longer scales paler, dirty white. Abdomen dorsally dark greyish brown on first two segments, gradually paler to greyish beige around genitalia; ventrally paler, with white on basal segments. Tympanal organs (n=3): Similar to those of *Neodactria luteolella* (Clemens) (see Landry, 1995: p. 198 fig. 230) except for shorter tympanic drums, not reaching tympanic bridge.

Male genitalia (n=2). (Figs 2–6). Uncus about as long as tegumen, slightly down curved evenly, evenly thin in side view, only slightly compressed from base to apex in dorsal view, with moderate setation from after base to before apex, apically rounded. Gnathos poorly developed, with very thin arms directed anteroventrally, apparently not connected ventrally. Tegumen short and bulky, with lateral arms about as long as dorsal connection, ventral connection narrow, apparently complete. Valva with costal process a wide hook well separated from costa of cucullus, reaching about middle of valve, slightly bulging dorsally at about 3/4, apically narrowing and pointed, like a Great Northern Loon's (*Gavia immer*) head, projecting medioventrally, with moderate setation mainly along dorsal edge; cucullus constricting at right angle and then half right angle from ventral margin at 2/3, with costal margin nearly straight, slightly upturned in distal 1/3, with ventral margin broadly concave at 1/3, apically rounded, with abundant, short setation along ventral edge, medially and along costal margin less abundant but longer; sacculus forming more thickly sclerotized and apically rounded short ridge with moderate to short setation medially. Juxta associated with large membranous sac reaching inward beyond vinculum to distance equal to length of vinculum. Vinculum with arms of moderate width, only slightly longer ventrally, with medioventral margin straight, without saccus. Pseudosaccus low and short, reaching middle of vinculum's ventral length. Phallus straight, about 10% longer than valva, open dorsally on distal 1/3 and slightly directed downward, with scobination on ventral wall on distal third, apically with thin, pointed projection; vesica without cornutus.

FEMALE. (n=1). Forewing length: 8.5 mm; frenulum not visible (specimen not spread). Female genitalia (n=1) (Fig. 7): Papillae anales with setation of medium length and with scobination. Posterior apophyses about as long as papillae, straight, moderately narrow to very narrow distally, apically blunt. Anterior apophyses very short, subtriangular. Segment VIII very narrow dorsally, unsclerotized medially. Sterigma a pair of ventral rounded lobes of medium size reaching beyond posterior margin of segment, associated with short, membranous, rounded pouch. Ductus bursae short, about 1/3rd length of corpus bursae, of medium girth, doubling in size at midlength. Corpus bursae cylindrical and long, about 1/5th longer than segment VII, distally rounded, without signum.

Distribution. So far as known this species is only found in the Huachuca and Chiricahua Mountains, in Cochise County, Arizona.

Natural history. Unknown except that the moths are in flight between mid-July and early August and come to light. This species is probably univoltine given the strong seasonality of the rains in Arizona and also given that *N. caliginosellus* (Clemens, 1860), the only *Neodactria* species for which this information is known, is univoltine in Michigan and Virginia (Tashiro, 1970). The habitats in which this species has been collected are located between 1550 and 1707 m. The elevation at the type locality is about 1615 m and the vegetation is a blend of moisture loving sycamores (*Platanus* sp., Platanaceae), maples (*Acer* spp., Sapindaceae) and columbines (*Aquilegia* spp., Ranunculaceae) along the stream that flows through the canyon with extensive pine (*Pinus* spp., Pinaceae) and oak (*Quercus* spp., Fagaceae) forests (Fig. 8) on the dry slopes to desert grasslands at the bottom. Cacti (Cactaceae), yucca and agave (*Yucca* spp. and *Agave* spp., Asparagaceae) plants abound at this elevation. Figure 9 shows some of the vegetation at the Ash Canyon locality when the paratype was collected, in 1989. Caterpillars should be looked for at the base of, including below ground, grasses or other plants in the Poaceae family as other species of *Neodactria* have mostly been reported to feed on grasses, sometimes to the point of becoming pests of lawns, and seedling corn, but also on narrow leaf plantain (*Plantago lanceolata* L., Plantaginaceae) (see references in Landry, 1995: 103).

Remarks

The species' name is derived from the Arizona County where all known specimens were found. The county name in turn is derived from that of the legendary Chiricahua Apache war chief Cochise (ca. 1805-1874). The only female specimen available was not collected along any of the males nor in the same mountain range, but the markings are the same as in the available males, so much so that we are confident that the sexes of this species are not wrongly associated. The female genitalia of the unique female available were mounted on slide long before their description, which therefore is incomplete regarding some details. The type locality, in Ramsey Canyon, as well as Ash Canyon, are situated in the Huachuca Mountains, about 106 km west and south of Turkey Creek in the Chiricahua Mountains. The Ash Canyon specimen was collected on Noel McFarland's property, which was completely devastated in the fire that swept through the region in 2011. Only one other species of *Neodactria*, *N. luteolellus* (Clemens) is known from Arizona as far as we know. A series of 49 specimens collected in the White Mountains (some with additional locality data such as 'near McNary P[ost?]. O[ffice?].', 'near Rice, Elev[ation]. 7000 ft', 'Apache Ind[ian]. Res[ervation]. Elev. 7000 ft') in July and August 1925 by O. C. Poling (USNM) was examined and a pair was dissected to confirm the identification. This area is located about 240 km to the north of the Chiricahua Mountains locality, where a paratype of the new species was collected, and 294 km from its type locality. The higher elevation of this area (2133 m) and its more northern situation may mean that its habitats differ significantly from the habitats in which the new species was found. The forewing of these specimens is ochre brown at the base and usually darker brown on distal half, with the transverse bands sometimes indistinct. Their forewing length is between 10 and 12 mm. Their genitalia are as illustrated by Landry (1995: figs 283, 330), except for the less elongate and more angled tegumen in the male and the medially constricted corpus bursae in the female.

The discovery of *Neodactria cochisensis* sp. n. is not especially surprising as there are still too few collectors of smaller moths working in the vast species-rich parts of the south-western U.S.A. and taxonomists

interested in these moths are also very scarce. Since the works of Alexander B. Klots on North American Crambinae, between 1940 and 1970, when he described 25 species or subspecies, only two genera and eight species of Crambinae have been described from North America, all but one species by BL and co-authors, or as single author. However, a few undescribed species of Crambinae genera other than *Neodactria* are known from collection specimens by BL. The restricted distribution of this new species in only three localities of south-eastern Arizona is not entirely surprising either as the last three species described in *Neodactria* are also known from restricted ranges: *N. daemonis* Landry & Klots, 2005 from one locality in Arkansas and one in Missouri, *N. oktibbeha* Landry & Brown, 2005 from two localities in Mississippi, and *N. glenni* Landry & Klots, 2002 from prairie sites in upper central Illinois, central eastern Mississippi, and central and east-central Missouri. However, the known restricted range is again partly a reflection of the poor sampling of the south-western sky islands, especially in adjacent Mexico.

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Editor's note

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